Emerging Technologies and the *Missio Dei*: Inviting Constructive and Critical Engagement

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Abstract: Digital devices and technologies, like smartphones, tablets, and laptops, have become integral to our daily lives. These contemporary technologies shape how we connect, communicate, and collaborate in our homes, workplaces, and churches. They have also granted us incredible conveniences and opportunities. Loved ones and colleagues can interact over great distances with relative ease. Information that once would have taken days to find and compile can be accessed momentarily. Increased efficiency and automation in day-to-day activities like shopping, paying bills, and investing point to the capacity of these tools to streamline and make many areas of our lives easier. These technologies have also brought several challenges and problems into our personal lives and our common life with one another. Increased screen time, the decline in in-person social interactions, the rise of social isolation and anxiety, privacy concerns, and changes to our brains are just a few examples of our digital age's "malformative" effects.

As the development and capacity of digital devices continue to advance in the years to come, emerging technologies like virtual reality (VR), augmented reality (AR), artificial intelligence (AI), the Internet of Things (IoT), robotics and autonomous systems, biotechnology and gene editing, and brain-computer interfaces (BCI) promise to shape our future in profound ways. Emerging technologies elicit theological reflection as they invite new possibilities for the life and witness of the church today and because they raise important questions about living in the world, interacting with others, and even being human. This kind of technological situation adds urgency for Christians to deal constructively and critically with emerging technologies and their implications for life, witness, and theology today.

The Digital Revolution

The world has experienced plenty of revolutions. "For nation will rise against nation and kingdom against kingdom," Jesus said (Mt 24:7). Political powers that once seemed destined to reign for eternity crumble and fall. However, another sort of revolution began transforming the world in the late 20th and early 21st centuries. It was not a political but a technological one: the digital revolution. The digital revolution is one of several industrial revolutions that have shaped the world. Klaus Schwab, the founder and chairman of the World Economic Forum, calls it "the fourth industrial

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revolution."[1] According to Schwab's analysis,[T]he first industrial revolution came with the rise of steam power (beginning in the 1760s), and the second came with the transition from steam power to electricity (in the decades around 1900). The third industrial revolution marks the transition from mechanical and analog electronic processes to digital computing (beginning in the 1950s), and the fourth industrial revolution represents the internet revolution and its continual unfolding with artificial intelligence (from the 1990s onward).[2]

Each of these revolutions has shaped the world, but the speed at which the internet and digital devices have been created and integrated into our lives is astonishing.[3]

The digital revolution cannot be fully understood apart from the development of digital devices, especially the iPhone.[4] Consequently, Thomas Friedman points to 2007 CE as one of the most transitionary years in human history. As he puts it, "What the H*** Happened in 2007?"[5] In 2007, the iPhone was released; Facebook (now Meta) left college campuses and entered the wider world; Twitter (now X) was spun off; Google bought YouTube and launched Android; Netflix began streaming videos; Amazon released the Kindle; and Internet users surpassed one billion worldwide.[6] 2007 was revolutionary not just because the iPhone was released but because of all its release set in motion and all that came after.

In just under twenty years after the release of the iPhone, terms like artificial intelligence (AI), transhumanism (Humanity+), posthumanism, the Internet of Things (IoT), the Metaverse, virtual reality (VR), and augmented reality (AR) have become more and more common in scholarly literature and pop culture. These technologies emerge from the digital revolution and fundamentally intensify its values and practices. In *Future Politics: Living Together in a World Transformed by Tech,* Jamie Susskind argues that three defining features will characterize our shared techno social future: 1) increasingly capable systems, 2) increasingly integrated technology, and 3) an increasingly quantified society.[7]

The development of increasingly capable systems such as AI and machine learning algorithms promises not just to perform tasks that were once believed to require the cognitive and creative processes of human persons with extraordinary speed and efficiency but also to be able to "learn" apart from the programming of their human creators.[8] These developments are predicated on advances in mathematics, philosophy, and neuroscience and the explosion in available data and computing power.[9] The optimism behind machine learning is undergirded by "Moore's Law," a theory that posits computer processing doubles roughly every two years. This theory has led futurist Ray Kurzweil to predict that by 2050, "one thousand dollars of computing will exceed the processing power of all human brains on earth."[10]

Susskind contends that emerging technologies will be "more *pervasive*, more *connective*, more *sensitive*, more *constitutive*, and more *immersive.*"[11] Let us consider the last one by looking at augmented reality (AR) and virtual reality (VR). Through smart glasses or goggles, AR "allows the wearer to experience digital images overlaid onto the physical world. They might show directions to a park, or assembly instructions for a new wardrobe."[12] Examples of this technology are Snapchat *Lenses*, which allows selfies to be edited with animations and filters, and *Pokémon Go*, a smartphone game that overlays the real world with digital Pokémons that must be captured and trained. VR promises an even more immersive experience.

Unlike AR, which overlays digital images onto the real world, VR headsets allow users to enter into three-dimensional virtual worlds where, through the power of "haptic" technology embedded in clothing, suits, and gloves, users can feel and experience tactile feedback, often called "presence."[13] In the future, workers will attend virtual meetings, shoppers will peruse virtual shopping malls, sports fans will attend virtual stadiums, and people will even seek out virtual brothels.[14] Thus, emerging technologies promise to shape the most public and private of experiences.[15]

Finally, the use of digital devices and emerging technologies will lead to an incredible amount of data that can be sorted, stored, processed, and quantified.[16] The twenty-first century has seen an astronomical explosion in data generated and processed by persons and machines. "Today," Susskind writes, "humans generate roughly the same amount of information every couple of hours as they did from the dawn of civilization until 2003."[17] However, this data is not being forgotten or wiped away but stored and "used for commercial purposes, to train machine learning systems, and to predict and control human behaviour."[18]

In *The Age of Surveillance Capitalism*, Shoshana Zuboff argues that the gathering of data by big tech firms and political powers constitutes a new, unprecedented form of power, which she calls "instrumentarianism" or "instrumentarian power," consisting of the "instrumentation and instrumentalization of behavior for the purposes of modification, prediction, monetization, and control."[19] Thus, the growth and integration of these technologies into our world and lives must also be coupled with conversations regarding regulation, privacy rights, and how data is to be used, controlled, owned, shared, and sold.

Emerging Technologies and Their Impact

The creation of the printing press, television, the internet, and the iPhone didn't just reshape our physical landscape and infrastructure; they fundamentally reshaped how we imagine our world, ourselves, our values, beliefs, lifestyles, and interactions—often in ways we are not consciously aware of.[20] Emerging technologies will do the same, generating what Neil Postman calls "ecological" change,

> Technological change is neither additive nor subtractive. It is ecological. I mean "ecological" in the same sense as the word is used by environmental scientists. One significant change generates total change. If you remove caterpillars from a given habitat, you are not left with the same environment minus caterpillars: you have a new environment, and you have reconstituted the conditions of survival; the same is true if you add caterpillars to an environment that has had none. This is how the ecology of media works as well. A new technology does not add or subtract something. It changes everything. In the year 1500, fifty years after the printing press was invented, we did not have old Europe plus the printing press. We had a different Europe.[21]

One of the most striking ways emerging technologies will bring about ecological change is the gradual blurring of once central distinctions like physical reality/virtual reality, offline/online, and human/robot. Total immersion in a digital world through

VR or overlaying digital objects onto the physical world through AR will gradually dissolve the distinction between physical and virtual reality.[22] Some futurists believe that one day, we might live fully immersed in mixed reality (MR), where VR and AR are so advanced that there is functionally no longer a distinction between physical and virtual reality.[23]

Similarly, the distinction between offline/online is increasingly blurring due to the Internet of Things (IoT).[24] IoT refers to the network of physical, interconnected devices—like phones, appliances, vehicles, sensors, and thermostats, to name a few—that are embedded with technology to collect, exchange, and act on data due to their connection to the internet. This connection enables them to interact, collect data, and make decisions, often without human prompting. In this connected context, it will become increasingly challenging to notice a distinction between our offline and online lives.

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Finally, emerging technologies will reshape how humans understand themselves. It is often believed that technology will evolve, upgrade, and update, but humans will stay the same. Michael Bess, however, calls this presumption "the Jetsons fallacy" and argues that it is fundamentally mistaken.[25] Not only do technologies like digital devices shape us physically by altering our brains and, therefore, our behavior, but a growing number of futurists and technologists point to the day when integrating technologies like brain-computer interfaces (BCI) into our bodies and employing technological capacities like gene editing and biohacking will become commonplace.[26] Yuval Noah Harari describes how this might come about,

> *Homo sapiens* is likely to upgrade itself step by step, merging with robots and computers in the process, until our descendants look back and realize that they are no longer the kind of animal that wrote the Bible, built the Great Wall of China and laughed at Charlie Chaplin's antics. This will not happen in a day, or a year. Indeed, it is already happening right now, through innumerable mundane actions. Every day millions of people decide to grant their smartphone a bit more control over their lives or try a new and more effective antidepressant drug. In pursuit of health, happiness, and power, humans will gradually change first one of their features and then another, and another, until they will no longer be human.[27]

The growing plausibility and practice of integrating technological systems and capacities into human bodies will likely blur the distinction between humans and robots.

A Posture for Engagement: Cultivation and Creation

Emerging technologies elicit a wide range of reactions. Some see these technologies as ushering in a time of increased efficiency, leisure, and automation, leading to human flourishing and happiness. Others see them as the harbingers of a dystopian, tech-dominated future. The reality is that technological innovations have always created polarizing responses.[28] So, how might the church engage these technologies? Andy Crouch has proposed a constructive posture that is well-suited for the church's engagement with emerging technologies.

In his influential work, *Culture Making: Recovering Our Creative Calling*, Crouch argues that Christians must recover their identity as "creators and cultivators… artists and gardeners… creaturely creators, tending and shaping the world" God has made.[29] Made in the image of God (Gen 1:26–27; Gen 5:1-3; 9:5– 6) and renewed in that image through the work of Christ and our baptism into Him (Rom 8:29; 2 Cor 3:18; Col 3:10; Eph 4:24), God's people are called to tend and cultivate God's creation.[30]

This tending and cultivating work does not just consist of maintaining creation's natural state;[31] instead, as Anthony Hoekema writes, it means that because humans are made in God's image, they are "called by God to develop all the potentialities found in nature and in humankind as a whole. [They] must seek to develop not only agriculture, horticulture, and animal husbandry, but also science, technology, and art… to develop a God-glorifying culture."[32] The question is how to do this faithfully, because there is a difference between imaging God as His creative creatures and trying to overcome our creatureliness through our creations in the vain attempt to become like God.[33]

In keeping with the vision of humanity laid out in Genesis 1-2, Crouch argues that God's people should take up a posture of cultivation and creation as they relate to various cultural goods and artifacts.[34] Rather than being a people who are habitually reactionary and dismissive of various cultural goods and artifacts, Christians should develop a posture of cultivation. They should use, improve, and adapt them to glorify God and serve their neighbor. As Christians seek to embody a posture of cultivation, they are also freed to employ certain gestures, such as condemning, critiquing, copying, and consuming.[35] So, what might this look like more concretely? Let's take the example of VR.

Many Christians might be immediately dismissive of the use of VR. Yet, Darrell Bock and Jonathan Armstrong argue that VR can be an incredible pedagogical tool that, among other things, could display God's glory in the created universe while speaking and teaching about His presence and power.[36] They also believe VR might be an essential tool to engage Christians where meeting together in a church is illegal or where Christians are actively persecuted.[37]

These are examples of how an emerging technology like VR, when engaged in a posture of cultivation, can bring glory to God, and serve our neighbor in a way that might not have been thought of if we had a purely reactionary and critical posture. However, there are also examples where a particular gesture is needed concerning VR. An instance in which God's people should employ the gesture of condemnation is the use of VR to engage in any number of sexual scenarios with any number of virtual avatars and experience sexual sensations through haptic technology.[38]

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Emerging technologies present pros and cons, strengths and weaknesses, affordances and drawbacks, possibilities, and perils for God's people today. That is why godly wisdom, discernment, and engagement are needed to help Christians deal constructively and critically with these emerging technologies and their implications for life, witness, and theology today. As a result, the November 2025 issue of *Lutheran Mission Matters* will delve deeper into the intersection of emerging technologies and Christian theology. Among other things, emerging technologies inevitably raise questions about theological concepts and frameworks.

Questions

- How do emerging technologies impact theological concepts and understandings?
- What are the implications for doctrines like creation, providence, and human agency in a world increasingly shaped by machine learning and algorithms?
- As the distinction between physical reality/virtual reality and human/robot becomes increasingly obscured, what does this mean for questions of theological anthropology and ecclesiology?

Emerging technologies also raise ethical considerations from several perspectives, from parish pastors engaged in sermon writing and by-law revisions to doctors seeking a better understanding of the relationship between therapeutic correction and technological enhancement in their medicinal practice.

Questions

- What ethical challenges arise from integrating AI and digital technologies into ministry practices, such as sermon writing?

- What are the implications of using AI to compose church documents like policies and bylaws?
- How might churches and pastors balance AI's efficiency and insights with the need for human wisdom and discernment?
- What are the ethical considerations for Christians when deciding whether to integrate emerging technologies into their bodies?
- How does the Christian understanding of human persons as finite and limited inform decisions about integrating life-extending or life-enhancing technologies?

Emerging technologies also invite the church to consider how it engages in the work of mission, witness, and faith formation.

Questions

- How can AI, VR, and other digital and emerging technologies be used to advance mission objectives?
- What are the opportunities and risks associated with using these technologies for evangelism, church planting, and global outreach, and how might they reshape traditional mission strategies and practices?
- How might AI and immersive technologies like VR and AR transform Christian education and formation?
- What might faith formation look like in a digital age?

Finally, emerging technologies and technological visions like transhumanism (Humanity+) and posthumanism invite the church to give an account of what it means to live well as finite, limited creatures who look forward to the resurrection of the dead and the life of the world to come, all as a result of God's gracious initiative and work.

Questions

- How should Christian theology respond to technological visions like transhumanism (Humanity+) that seek to transcend human limitations through technology?
- What are the theological and ethical implications of pursuing human enhancement in light of the Christian account of creation and new creation?

The technological landscape is rapidly changing, and it is changing us too. This reality makes many excited about the future, while others look forward with fear and trepidation. Yet God's people believe in the crucified and risen Lord Jesus Christ, who rules and reigns over all things visible and invisible and will come again to judge the living and the dead and make all things new. In this hope and confidence, God's people are empowered to take up questions like these with godly creativity and wisdom.

ENDNOTES

[1] Klaus Schwab, *The Fourth Industrial Revolution* (New York: World Economic Forum, 2016).
[2] Darrell L. Bock and Jonathan J. Armstrong, *Virtual Reality Church: Pitfalls and Possibilities (Or How to Think Biblically about Church in Your Pajamas, VR Baptisms, Jesus Avatars, and Whatever Else is Coming Next)* (Chicago: Moody Publishers, 2021), 36.
[3] Schwab, *The Fourth Industrial Revolution*, 8, "The spindle (the hallmark of the first industrial revolution) took almost 120 years to spread outside of Europe. By contrast, the internet permeated across the globe in less than a decade."
[4] See Felicia Wu Song, *Restless Devices: Recovering Personhood, Presence, and Place in the Digital Age* (Downers Grove: IVP Academic, 2021).
[5] Thomas Friedman, *Thank You for Being Late: An Optimist's Guide to Thriving in an Age of Accelerations* (New York: Farrar, Straus, and Giroux, 2016), 19. Cited in James Emery White, *Hybrid Church: Rethinking the Church for a Post-Christian Digital Age* (Grand Rapids: Zondervan Reflective, 2023), 39.
[6] White, *Hybrid Church*, 39.
[7]Jamie Susskind, *Future Politics: Living Together in a World Transformed by Tech* (Oxford: Oxford University Press, 2018), 22.
[8] Susskind, *Future Politics*, 30–36.
[9] Susskind, *Future Politics*, 38.
[10] Ray Kurzweil, *The Singularity Is Near* (New York: Viking, 2005), 127. Cited in Susskind, *Future Politics*, 38.
[11] Susskind, *Future Politics*, 43.
[12] Susskind, *Future Politics*, 58.
[13]See Peter Rubin, *Future Presence, How Virtual Reality Is Changing Human Connection, Intimacy, and the Limits of Ordinary Life* (New York: Harper One, 2018), 165–193; See also, Jeremy Bailenson, *Experience on Demand: What Virtual Reality Is, How it Works, and What it Can Do* (New York: W.W. Norton & Company, 2018).
[14] Susskind, *Future Politics*, 60.
[15] For a relevant discussion of the many ways VR might change our lives, see Mark Zuckerberg, "Founder's Letter, 2021" October 28, 2021, https://about.fb.com/news/2021/10/founders-letter/
[16] Susskind, *Future Politics*, 61.
[17] Susskind, *Future Politics*, 61.
[18] Susskind, *Future Politics*, 61,
[19] Shoshana Zuboff, *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power* (New York: Public Affairs, 2019), 352.
[20] For an analysis of the transformative power of a technological medium, see Marshall McLuhan, *The Gutenberg Galaxy*: *The Making of Typographic Man* (1962; Toronto: The University of Toronto Press, 2011); Marshall McLuhan, *Understanding Media: The Extensions of Man* (1964; Cambridge: MIT Press, 1994).
[21] Neil Postman, *Technopoly: The Surrender of Culture to Technology* (New York: Vintage, 1992), 18.
[22] David J. Chalmers, *Reality +: Virtual Worlds and the Problem of Philosophy* (New York: W.W. Norton & Company, 2022), xvii, argues that "virtual reality is genuine reality." He calls this "virtual realism," the "thesis that virtual reality is a genuine reality, with emphasis on the thesis that virtual objects are real and not illusory" (p. 470).
[23] For examples of what these technosocial futures might look like and how they might work, see Herman Narula, *Virtual Society: The Metaverse and the New Frontiers of Human*

Experience (Great Britain: Penguin Business, 2022); Matthew Ball, *The Metaverse and How It Will Revolutionize Everything* (New York: Liveright Publishing Corporation, 2022).
[24] See Samuel Greengard, *The Internet of Things* (Cambridge: MIT Press, 2015).
[25] Michael Bess, *Make Way for the Superhumans: How the Science of Bio-enhancement Is Transforming Our World, and How We Need to Deal with It* (London: Icon, 2016), 7.
[26] See Joel Oesch, *Crossing Wires: Making Sense of Technology, Transhumanism, and Christian Identity* (Eugene: Wipf & Stock, 2020), 1–18; 51–65.
[27] Yuval Noah Harari, *Homo Deus: A Brief History of Tomorrow* (2016; New York: Harper Perennial, 2018), 49.
[28] See A. Trevor Sutton, "Looking into the AI Mirror: Optimism, Pessimism, or Something Else," *Journal of Lutheran Ethics* 24, no. 4 (August/September 2024), https://learn.elca.org/jle/looking-into-the-ai-mirror-optimism-pessimism-or-something-else/
[29] Andy Crouch, *Culture Making: Recovering Our Creative Calling*, expanded ed. (2008; Downers Grove: IVP 2023), 97.
[30] On the image of God and its loss and renewal, see Formula of Concord, Solid Declaration 1, 10–14; Cited in Robert Kolb and Timothy J. Wengert, *The Book of Concord: The Confessions of the Evangelical Lutheran Church* (Minneapolis: Fortress Press, 2000), 533–534.
[31] Andy Crouch, *Playing God: Redeeming the Gift of Power* (Downers Grove: IVP, 2013), 105, "When human beings do what they were created to do, the latent possibilities in creation come to fruition, a flourishing reality that would never exist without the application of human intelligence and intentionality. That is what image bearing is for." Cited in Dennis P. Hollinger, *Creation and Christian Ethics: Understanding God's Designs for Humanity and World* (Grand Rapids: Baker Academic, 2023), 68.
[32] Anthony A. Hoekema, *Created in God's Image* (Grand Rapids: Eerdmans, 1994), 14. Cited in Hollinger, *Creation and Christian Ethics*, 145; cf. 177.
[33] Hollinger, *Creation and Christian Ethics*, 222–246, argues that as Christians engage with emerging technologies and consider the potential of technological enhancements, they must do so in ways that respect rather than transgress their fundamental constitution as finite, limited, and dependent creatures. Cf. Lydia Jaeger, *Ordinary Splendor: Living in God's Creation*, trans. Jonathan Vaughan (Bellingham: Lexham Press, 2023).
[34] Crouch's posture of cultivation relies on a robust doctrine of creation, vocation, and eschatology. For further discussion, see William W. Schumacher, "Theology for Culture: Confrontation, Context, and Creation," *Concordia Journal* 42, no. 3 (Summer 2016): 211–222.
[35] Crouch, *Culture Making*, 93–98, encourages readers not to let these gestures turn into their operating posture.
[36] Bock and Armstrong, *Virtual Reality Church*, 20.
[37] Bock and Armstrong, *Virtual Reality Church*, 21. The LCMS council of presidents encourages and advocates for the continued practice of in-person communion, as opposed to virtual or online communion. I, too, affirm the practice of in-person communion, as opposed to virtual or online communion. https://files.lcms.org/file/preview/6CAF272D-692A-4653-9005-A5C931CD045B cf. Resolution 5-08A, "To Affirm In-Person Communion," from the 68th Regular Convention of the Lutheran Church—Missouri Synod. https://reporter.lcms.org/2023/convention-affirms-in-person-communion/ .
[38] See Rubin, *Future Presence*, 195–220; Oesch, *Crossing Wires*, 66–83.